

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 – 16 (Canceled)

17. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system, comprising:

- identifying the cyclic breathing activity and cyclic heart beating sounds;
- segmenting said raw respiratory and said raw heart beating sounds;
- classifying said segments of said raw respiratory and said raw cardiac sounds;
- extracting time dependent features of said classes;
- comparing features of said classes;
- determining the significance of the deviation of a set of said features from a respective set of baseline values; and

wherein said heart beating sounds are selected from the group including first heart sound, second heart sounds, and any combinations thereof, and

wherein said breathing is selected from the group including inspiration, expiration, the pauses between them, and any combinations thereof, and

wherein said cardio/pulmonary system is selected from the group including cardio vascular system, lungs and the thorax.

18. (Withdrawn) A method for utilization of within breath variability (WBV) of

the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 17, wherein pressure changes in the cardio/pulmonary system are changes selected from the group of changes including intrathoracic pressure and hemodynamic pressure.

19. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 18 wherein intrathoracic pressure changes are caused by any cause selected from the group including changes in air way resistance, asthma and resistive breathing.

20. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 19, wherein changes in said intrathoracic pressure are caused by changes in compliance.

21. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 20 wherein changes in said compliance are caused by congestive heart failure.

22. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 19 wherein changes in said intrathoracic pressure are caused by positive pressure artificial ventilation.

23. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 18 wherein changes in said hemodynamic pressure are caused by shock.

24. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 17 wherein pressure changes in the cardio/pulmonary system are caused by changes selected from the group including heart mechanics changes, cardiac medications and cardiac contractility, and any combination thereof.

25. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 17 wherein said WBV is determined by the amplitude of heart sounds selected from the group including the second and first heart sound.

26. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 17 wherein said WBV is determined by calculating the ensemble average in the domains selected from group of domains including time domain and frequency domain.

27. (Withdrawn) A method for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system as in claim 17 wherein said WBV is determined by measuring the changes selected from a group of changes including the frequency contents of the heart sound and morphology changes in the heart sound.

28. (Withdrawn) A system for utilization of within breath variability (WBV) of the heart sounds for assessing pressure changes in the cardio/pulmonary system, comprising:

- at least one means for collecting heart beating sounds;
- means for collecting cyclic sound of the respiratory system, and
- a means for processing said sounds, and

wherein said processing comprises:

- identifying the cyclic breathing activity and cyclic heart beating sounds;
- segmenting said raw respiratory and said raw heart beating sounds;
- classifying said segments of said raw respiratory and said raw cardiac sounds;
- extracting time dependent features of said classes;
- comparing features of said classes, and
- determining the significance of the deviation of a set of said features from a respective set of baseline values.

29. (New) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity and cardiac sounds;
- temporally segmenting said respiratory and said cardiac sounds to express the segments of physiological rhythmicity ;
- extracting stable features of the heart sounds with

respect to their timing in the respiratory cycle, thus providing synchronized stable features for diminishing stochastic variability;

- averaging the features of segments of heart sounds with respect to the corresponding respiratory cycle whilst preserving the temporal variability of said segments;
- determining the extent of temporal variability of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline .

30. (New) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient as in claim 29, said method used for synchronizing a heartbeat synchronized system, said analyzing based on the information derived from the group of items consisting of: heart sounds amplitude, interval between them, amplitude and frequency content, and any combination thereof.

31. (New) A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity and cardiac sounds;
- temporally segmenting respiratory and sounds and cardiac electrocardiographic signals to express the segments of physiological rhythmicity ;
- extracting stable features of the heart sounds with respect to their timing in the electrocardiographic signals, thus providing synchronized stable features for diminishing stochastic variability;
- averaging the features of segments of heart sounds with respect to the corresponding electrocardiographic signals whilst preserving the temporal variability of said segments;
- determining the extent of temporal variability of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline.

Annotated version of the Claims:

29. A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity and cardiac sounds;
- temporally segmenting (comms. 1, 1A, 1B) said respiratory and said cardiac sounds to express the segments of physiological rhythmicity (comm 2) ;
- extracting stable features (comms. 3, 4) of the heart sounds with respect to their timing in the respiratory cycle (comm. 5), thus providing synchronized stable features (comm. 4) for diminishing stochastic variability;
- averaging the features of segments of heart sounds (comm. 6) with respect to the corresponding respiratory cycle (comm. 7) whilst preserving the temporal variability (comm. 8) of said segments;
- determining the extent of temporal variability (comms. 8, 9, 9B) of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline (comms. 10, 10B).

30. A method for analyzing a change in the functionality of the heart and the respiratory system of a patient as in claim 29, said method used for synchronizing a heartbeat synchronized system, said analyzing based on the information derived from the group of items consisting of: heart sounds amplitude, interval between them, amplitude and frequency content, and any combination thereof.

31. A method for analyzing a change in the functionality of the heart and the respiratory system of a patient, comprising:

- identifying the respiratory activity and cardiac sounds;
- temporally segmenting (comms. 1, 1A, 1B) respiratory and sounds and cardiac electrocardiographic signals (comm. 21) to express the segments of physiological rhythmicity (comm 2) ;
- extracting stable features (comms. 3, 4) of the heart sounds with respect to their timing in the electrocardiographic signals (comm. 22), thus providing

synchronized stable features (comm. 4) for diminishing stochastic variability;

- averaging the features of segments of heart sounds (comm. 6) with respect to the corresponding electrocardiographic signals whilst preserving the temporal variability (comm. 8) of said segments;
- determining the extent of temporal variability (comms. 8, 9, 9B) of groups of synchronized stable sound features, and
- detecting change over time of at least one feature in a synchronized stable sound relative to a baseline (comms. 10, 10B).